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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/931,177	08/17/2001	Nicole Schodel	LINDE-567	1429
23599	7590	01/25/2005	EXAMINER	
MILLEN, WHITE, ZELANO & BRANIGAN, P.C. 2200 CLARENDON BLVD. SUITE 1400 ARLINGTON, VA 22201			DUONG, THANH P	
			ART UNIT	PAPER NUMBER
			1764	

DATE MAILED: 01/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/931,177

Applicant(s)

SCHODEL ET AL.

Examiner

Tom P Duong

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 November 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-10 and 25-35 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-10 and 25-35 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Applicants' remarks and amendments filed on November 11, 2004 have been carefully considered. Claim 1 has been amended. Claims 2 and 11-24 have been canceled. Claims 25- 35 have been added. Claims 1, 3-10, and 25-35 are pending in this application.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1, 5-10, 26-29, and 32-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Romantier et al. (6,168,765). Regarding claims 1 and 32-35, Romantier discloses a reactor (Fig. 1) for performing a heat-conditioned catalytic reaction in a process fluid, said reactor comprising: plates (11) that are arranged parallel to one another at a distance and that form flat channels (Col. 8, lines 22-25) or corrugated with grooves (Col. 8, lines 58-61) with lateral boundary areas that face one another, wherein a portion of said channels contain a solid catalyst (15, 23), (Col. 7, lines 51) and carry a process fluid, and another portion of said channels carry a heat transfer medium (16) in indirect heat contact with the process fluid, wherein said plates are flat or are provided with grooves or ribs (Figs. 2 and 3) and are coated at least partially with a catalyst on the surface that

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faces the process fluid (Col. 7, lines 53-54) ; wherein said lateral boundary areas are jacket pieces (plate closures) , which form a pressure-resistant cuboid block with said channels, plates, and with collectors (manifold volume 18) for the process fluid the heat transfer medium (Col. 7, lines 31-33). With respect to the reactor capable of operating more than 25 bar, Romantier discloses a reactor made of the same structure as the claimed invention as described above and is capable of carrying the same process (Col. 1, lines 29-37 and Col. 3, lines 10-15) as disclosed by Applicant (pages 6 and 7). In view of Romantier, one skilled in the art would have expected the reactor of Romantier is capable of operating more than 25 bar. In addition, it would have been obvious to design the reactor of Romantier so that it is capable of operating more than 25 bar in order to meet ASME pressure vessel requirements. Regarding claim 5, Romantier discloses plates have catalyst coating on both sides of the sheets (Col. 7, lines 50-55). Regarding claim 6, it is conventional to provide a support medium and/or metal carrier for the catalyst layer and it would have been obvious to do so here to provide supporting structure for the catalyst layer. Regarding claims 7-8 and 29, it is conventional to provide a catalyst layer with such thickness ranges to ensure optimum catalytic activity is obtained. Note, if a layer is too thin, catalytic activity will not be obtained. On the other hand, if a layer is too thick, it will likely to peel off due to internal stress and also reduces heat conductivity (See USPN 4,043,945). Regarding claim 9, Romantier does not disclose expressly the use aluminum plates. However, it appears the selection of metallurgy for the plate material is an obvious matter of design choice depending on the process

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requirements such as process fluid, its operating temperature, and pressure. Furthermore, Applicant has not disclosed criticality or unexpected results for selecting an aluminum material as the plate material; therefore, it would have been obvious that the plate material of Romantier will provide same heat transfer performance as the claimed invention. Regarding claim 10, Romantier discloses the plates are made of stainless steel material (Col. 8, lines 18-20). Regarding claim 26-28, Romantier discloses the width of the process channel of 0.5-5mm (Col. 8, lines 16-16) and distance between the plates is 2.5 to 20 mm.

2. Claims 3-4, 25, and 30-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Romantier '765 in view of VanDyke (5031,693). Regarding claims 3-4 and 30-31, Romantier fails to disclose the process channels contained corrugated or pleated sheets with perforations which form passage for the flow of process fluid. VanDyke teaches heat exchanger (Abstract and Fig. 2) with channels having corrugated or pleated sheets (8,9) with (10) to maximize intermixing and turbulence (Col. 1, lines 58-62) and improved heat transfer coefficient (Col. 5, lines 61-68). Regarding claim 25, Romantier discloses the width of the process channel of 0.5-5mm (Col. 8, lines 16-16).

Response to Arguments

Applicant's arguments with respect to claims 1-10 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tom P Duong whose telephone number is (571) 272-2794. The examiner can normally be reached on 8:00AM - 4:30PM.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Tom Duong
January 13, 2005

TD



Glenn Caldarola
Supervisory Patent Examiner
Technology Center 1700